Amendments to the Claims:

This listing of claims replaces all prior listings, and versions, of claims in the present application.

Listing of Claims:

1-60. (Canceled)

61. (Previously presented) A toy system comprising an encoder for encoding a data signal within an audio track to form a modified audio track, an electro-acoustic transducer for converting the modified audio track into a corresponding acoustic signal, and a toy responsive to the acoustic signal, wherein:

the encoder comprises:

(i) a first receiver operable to receive the data signal, the data signal defining a sequence of data symbols, the data signal having a data signal bandwidth, defined by a symbol duration of the data symbols, that is centered around a first frequency;

(ii) a spreader operable to spread the received data signal or a carrier signal modulated with the received data signal to form a spread signal having a signal bandwidth greater than the data signal bandwidth;

(iii) a modulator operable either:

a) to use the data signal, before being spread by said spreader, to modulate at least one separate periodic carrier signal, whose period is smaller than the symbol duration of the data symbols, to form a modulated carrier signal such that, after spreading by the spreader, a main band of a power spectrum of the spread and modulated signal is centered around a second frequency that is different from the first frequency and that lies within an audible frequency band of 20 Hz and 20 kHz; or

b) to use the spread signal to modulate at least one separate periodic carrier signal, whose period is smaller than the symbol duration of the data symbols, such that a main band of a power spectrum of the spread and modulated signal is centered around a

second frequency that is different from the first frequency and that lies within an audible frequency band of 20 Hz and 20 kHz;

(iv) a second receiver operable to receive an audio track;

(v) a combiner operable to combine the spread and modulated signal with the audio track to generate a modified audio track; and

(vi) an output operable to output the modified audio track,

and wherein the toy comprises: (i) an acousto-electric transducer operable to receive and convert the acoustic signal into a corresponding electrical signal; (ii) a decoder operable to de-spread and demodulate the electrical signal obtained from said acousto-electric transducer, in order to regenerate the data signal; and (iii) a responder responsive to the data signal.

62-100. (Canceled)

101. (Previously presented) A toy system according to claim 61, wherein the responder is operable to generate an output that is discernible to human beings.

102. (Previously presented) A toy system according to claim 101, wherein the responder is operable to cause the toy to output an acoustic signal determined using the data signal.

103. (Previously presented) A toy system according to claim 102, wherein the responder comprises a processor operable to select one of a plurality of sound files stored in a memory in dependence upon a content of the data signal, and to output the selected sound file via an electro-acoustic transducer.

104. (Previously presented) A toy system according to claim 103, wherein the memory is detachable.

105. (Previously presented) A toy system according to claim 101, wherein the responder is arranged to cause the toy to display a visual signal determined using the data signal.

106. (Previously presented) A toy system according to claim 101, wherein the responder is operable to cause a movement of the toy in dependence upon a content of the data signal.

107. (Previously presented) A toy system according to claim 101, wherein the responder is operable to cause a movement of part of the toy relative to the rest of the toy in dependence upon a content of the data signal.

108. (Previously presented) A toy system according to claim 61, wherein the toy further comprises:

a generator operable to generate a data signal;

a spreader operable to spread the generated data signal to form a spread signal; and

an electro-acoustic transducer operable to receive and to convert the spread signal into an acoustic signal.

109-146. (Canceled)

147. (Previously Presented) A toy system according to claim 61, wherein the received data signal is a baseband signal such that the first frequency is 0 Hz.

148. (Previously Presented) A toy system according to claim 61, wherein the encoder comprises an oscillator operable to generate the at least one periodic carrier signal.

149. (Previously Presented) A toy system according to claim 61, wherein the at least one carrier signal is a sinusoid signal.

150. (Previously Presented) A toy system according to claim 61, wherein the spreader comprises a first pseudo-noise code generator operable to generate a first pseudo-noise code comprising a sequence of chips, and is operable to perform direct sequence spread spectrum encoding using the first pseudo-noise code.

151. (Previously Presented) A toy system according to claim 150, wherein the first pseudo-noise code generator is operable to generate a 12 bit code having 4095 chips.

152. (Previously Presented) A toy system according to claim 150, wherein the spreader is operable to combine each data element of the data signal with a part of the first pseudo-noise code.

153. (Previously Presented) A toy system according to claim 152, wherein the spreader is arranged to multiply each data element of the data signal by a sequence of two hundred and fifty-six chips of the first pseudo-noise code.

154. (Previously Presented) A toy system according to claim 150, wherein the spreader further comprises a second pseudo-noise code generator operable to generate a second pseudo-noise code which is different to the first pseudo-noise code,

and the spreader being arranged to combine each data element of the data signal with a chip sequence from either the first pseudo-noise code or the second pseudo-noise code in dependence upon the value of the data element.

155. (Previously Presented) A toy system according to claim 154, wherein the second pseudo-noise code generator is operable to generate a second pseudo-noise code orthogonal to the first pseudo-noise code.

156. (Previously Presented) A toy system according to claim 61, wherein the encoder further comprises a scaler operable to scale the spread and modulated signal.

157. (Previously Presented) A toy system according to claim 156, wherein the decoder further comprises a de-scaler operable to remove the scaling applied by the scaler.

158. (Previously Presented) A toy system according to claim 156, wherein the scaler is operable to perform a frequency dependent scaling.

159. (Previously Presented) A toy system according to claim 158, wherein the scaler is operable to increase the proportion of the energy at lower frequencies.

160. (Currently Amended) A toy system according to claim 159, wherein the scaler is arranged to apply a frequency-dependent scaling function having a frequency dependence between 1/f and ~~1/f2~~ $\underline{1/f^2}$, where f is the frequency.

161. (Previously Presented) A toy system according to claim 159, wherein the scaling function is approximately inverse to the sensitivity of a human ear.

162. (Previously Presented) A toy system according to claim 61, wherein the encoder further comprises a scaler operable to scale the spread signal and a power monitor operable to output a signal indicative of the power in the audio track to the scaler, and wherein the scaler is operable to vary the applied scaling in dependence upon the power signal output by the power monitor.

163. (Previously Presented) A toy system according to claim 162, wherein the scaler is operable to adjust the power in the spread and modulated signal to be a fixed amount below the power in the audio track, unless the power of the audio track is below a threshold in which case the power of the spread and modulated signal is set at a predetermined level.

164. (Previously Presented) A toy system according to claim 61, wherein the encoder further comprises a scaler operable to scale the spread and modulated signal and a psycho-acoustic analysis system for determining theoretical minimum audible sound levels in the presence of the audio track, and wherein the scaler is operable to scale the spread signal in accordance with the determined theoretical minimum audible sound levels.

165. (Previously Presented) A toy system according to claim 164, wherein the scaler is operable to scale the power of the spread and modulated signal to be at or above the determined minimum audible sound level.

166. (Previously Presented) A toy system according to claim 165, wherein the scaler is operable to scale the power of the spread and modulated signal to be a predetermined amount above the theoretical minimum audible level.

167. (Previously Presented) A toy system according to claim 164, wherein the psycho-acoustic analysis system is operable to analyze the audio track in segments whose duration corresponds to the duration of an integer number of data elements of the data signal, and wherein the encoder is operable: (1) to scale a portion of the spread and modulated signal corresponding to one data element of the data signal in accordance with the minimum audible sound level calculated for a segment of the audio track; and (ii) to subsequently combine said portion of the spread and modulated signal with said segment of the audio track.

168. (Previously Presented) A toy system according to claim 167, wherein the decoder does not include a de-scaling unit.

169. (Previously Presented) A toy system according to claim 164, wherein the psycho acoustic analysis unit is operable to generate frequency-dependent scaling factors corresponding to a segment of the audio track in accordance with the frequency spectrum of that segment.

170. (Previously Presented) A toy system according to claim 150, wherein said decoder is operable to demodulate the electrical signal,

wherein the decoder comprises a second pseudo-noise code generator operable to generate a second pseudo-noise code identical to the first pseudo-noise code, and wherein the decoder is operable to synchronously multiply the demodulated signal by the second pseudo-noise code to form a de-spread signal.

171. (Previously Presented) A toy system according to claim 150, wherein the decoder of the toy comprises:

a second pseudo-noise code generator operable to generate a second pseudo-noise code identical to the first pseudo-noise code, and wherein the decoder is operable to synchronously multiply the electrical signal by the second pseudo-noise code to form a de-spread signal; and

a demodulator operable to demodulate the de-spread signal to form a demodulated signal.

172. (Previously Presented) A toy system according to claim 170, wherein the decoder comprises a rake receiver having a plurality of prongs, and the decoder is operable to introduce different time delays between the electrical signal and the second pseudo-noise code in each prong of the rake receiver, in order to de-spread different components of the electrical signal.

173. (Previously Presented) A toy system according to claim 170, wherein the decoder further comprises a synchronization circuit operable to synchronize the second pseudo-noise code with a code sequence conveyed by the electrical signal.

174. (Previously Presented) A toy system according to claim 173, wherein the synchronization circuit comprises:

a correlator operable to generate a time-varying output dependent on the similarity of a chip sequence conveyed by the electrical signal and a predetermined chip sequence; and

a normalization circuit operable to scale the time-varying output of the correlator by a normalization factor determined from the average value of the time-varying output over a predetermined period of time.

175. (Previously Presented) A toy system according to claim 174, wherein the normalization circuit comprises a calculator operable to calculate a running average of the time-varying output over the predetermined period of time.

176. (Previously Presented) A toy system according to claim 173, wherein the synchronization circuit comprises:

a correlator operable to generate a time-varying output by correlating a chip sequence conveyed by the electrical signal and a predetermined chip sequence;

a cross-correlator operable to cross-correlate the output of the correlator over a first time period with the output of the correlator over a second time period; and

a determiner operable to determine a frequency offset between the frequency at which the second pseudo-noise code generator generates the second pseudo-noise code and the frequency of the code sequence conveyed by the electrical signal from the output of the cross-correlator.

177. (Previously Presented) A toy system according to claim 173, wherein the synchronization circuit comprises:

a correlator operable to generate a time-varying output by correlating a chip sequence conveyed by the electrical signal and a predetermined chip sequence;

a cross-correlator operable to cross-correlate the output of the correlator over a first time period with the output of the correlator over a second time period; and

a determiner operable to determine the difference between the chip rate of the predetermined chip sequence and the chip rate of the chip sequence conveyed by the electrical signal from the output of the cross-correlator.

178. (Previously Presented) A toy system according to claim 176, further comprising a normalization circuit operable to scale the time-varying output of the correlator by a normalization factor determined from the average value of the time-varying output over a predetermined period of time.

179. (Previously Presented) A toy system according to claim 178, wherein the normalization circuit comprises a running average calculator operable to calculate a running average of the time-varying output over the predetermined period of time.

180. (Previously Presented) A toy system according to claim 173, wherein the synchronization circuit comprises:

a plurality of correlators, each correlator arranged to generate a time-varying output determined by correlating a chip sequence conveyed by the electrical signal and a respective predetermined chip sequence; and

a controller operable to control the second pseudo-noise code generator in accordance with the outputs of the plurality of correlators,

wherein the respective predetermined chip sequences have the same chip rate.

181. (Previously Presented) A toy system according to claim 180, wherein the plurality of correlators are cascaded in series.

182. (Previously Presented) A toy system according to claim 180, wherein the plurality of correlators are connected in parallel.

183. (Previously Presented) A toy system according to claim 180, further comprising a plurality of normalization circuits, each normalization circuit being operable to scale the time-varying output of a respective one of the plurality of correlators by a normalization factor determined from the average of the time-varying output of that correlator over a predetermined period of time.

184. (Previously Presented) A toy system according to claim 183, wherein the normalization circuit comprises a running average calculator operable to calculate a running average of the time-varying output over the predetermined period of time.

185. (Currently Amended) A toy system according to claim 173, wherein the synchronization circuit further comprises:

a plurality of cross-correlators, each cross-correlator being arranged to cross-correlate the output of a respective one of the plurality of correlators over a first time period with the output of that respective correlator over a second time period;

an adder operable to add the outputs of each of the cross-correlators; and

a determiner operable to determine a frequency offset between the frequency at which the ~~2~~ second pseudo-noise code generator generates the second pseudo-noise code and the frequency of the spreading code in the electrical signal from the output of the adder.

186. (Previously Presented) A toy system according to claim 174, wherein the correlator is formed by a matched filter.

187. (Previously Presented) A toy system according to claim 61, wherein the encoder forms part of a television broadcast system, and the electro-acoustic transducer is formed by a loudspeaker of a television set.

188. (Previously Presented) A toy system according to claim 61, wherein the audio track is the audio track of a television programme, and the data signal is operable to enable the toy to interact with the television programme.

189. (Previously Presented) A toy system according to claim 61, in which the modified audio track is recorded on a recording medium, and the toy system further comprises a

reproducing apparatus, including the electro-acoustic transducer, for reproducing the modified audio track stored on the recording medium.

190. (Previously Presented) A toy system according to claim 189, wherein the recording medium is a compact disc.

191. (Previously Presented) A toy system according to claim 189, wherein the recording medium is a video cassette.

192. (Previously Presented) A toy system according to claim 171, wherein the decoder comprises a rake receiver having a plurality of prongs, and the decoder is operable to introduce different time delays between the electrical signal and the second pseudo-noise code in each prong of the rake receiver, in order to de-spread different components of the electrical signal.

193. (Previously Presented) A toy system according to claim 177, further comprising a normalization circuit operable to scale the time-varying output of the correlator by a normalization factor determined from the average value of the time-varying output over a predetermined period of time.

194. (Previously Presented) A method of controlling a toy, the method comprising the steps of:

receiving, at a control center, a data signal defining a sequence of data symbols, the data signal having a data signal bandwidth, defined by a symbol duration of said data symbols, that is centered around a first frequency;

spreading the received data signal or a carrier signal modulated with the received data signal to form a spread signal having a signal bandwidth greater than said data signal bandwidth;

either:

a) using the data signal before being spread in said spreading step to modulate at least one separate periodic carrier signal, having a period

which is smaller than said symbol duration, to form a modulated carrier signal such that, after spreading in said spreading step, a main band of a power spectrum of the spread and modulated signal is centered around a second frequency that is different from said first frequency and that lies within an audible frequency band of 20 Hz and 20 kHz; or

b) using the data signal after being spread in said spreading step to modulate at least one separate periodic carrier signal, having a period which is smaller than said symbol duration, such that a main band of a power spectrum of the spread and modulated signal is centered around a second frequency that is different from said first frequency and that lies within an audible frequency band of 20 Hz and 20 kHz;

combining the spread and modulated signal with an audio track to form a modified audio track;

transmitting the modified audio track to an electro-acoustic transducer in the vicinity of the toy;

converting the modified audio track into an acoustic signal at the electro-acoustic transducer;

receiving the acoustic signal at the toy;

converting the acoustic signal received by the toy into an electrical signal;

de-spreading and demodulating the electrical signal obtained by converting the acoustic signal to generate a de-spread signal;

regenerating the data signal from the demodulated and de-spread signal; and

controlling the toy in accordance with a content of the data signal.